

# PATENT ABSTRACTS OF JAPAN

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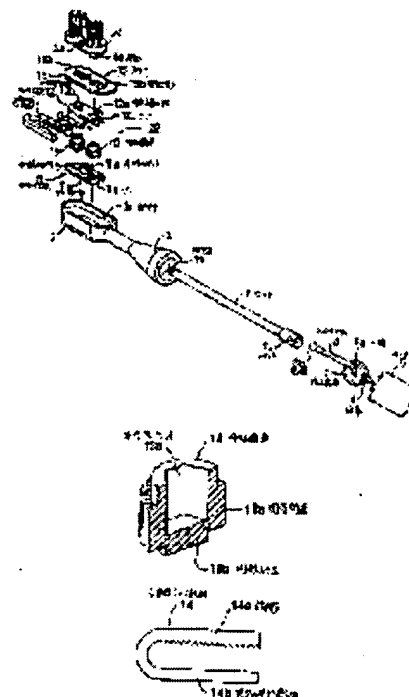
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## (54) TOOTH BRUSH

### (57)Abstract:

**PURPOSE:** To strengthen removing dental calculi by providing a transmission assembly vibrating two bristle holders, each with a carrier assembly capable of reciprocating together with the bristle holders and by vibrating a connector between the bristle holders and the brush head.

**CONSTITUTION:** Energizing a motor 5 reciprocates the bristle holders in the recess 3a of the brush head 3 via a transmission between the motor 5 and the bristle holders 4. Likewise, reciprocating the carrier assembly vibrates two bristle holders 4 of the gears 13 engaged with the geared legs 14a of the U-shape rack members 14 fixed in the brush head recess 3a around each axial line. Since these two bristle holders 4 are housed in a non-turning fashion inside the sockets 13c of the gears 13, respectively, they are clockwise turned during the forward stroke, while counterclockwise during the return stroke. The bristle holders 4 receive both the vibration and reciprocation motions likely as doing so to strengthen removing dental calculi.



## LEGAL STATUS

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CLAIMS

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[Claim(s)]

[Claim 1] The handle with which the end was equipped, the brush head with which the other end was equipped, and at least one bristle holder constructed across possible [ vibration ] in this brush head, In the gear-tooth brush which is made to combine the motor in said handle, and said motor with said bristle holder, and has the transfer assembly which vibrates said bristle holder at the time of energization of said motor While said transfer assembly is supporting said bristle holder, it has this bristle holder and the carrier assembly which can reciprocate together within this brush head by said motor. The coupling means between said bristle holders and said brush heads is a gear-tooth brush characterized by being effective in vibrating this bristle holder in case said bristle holder reciprocates by said motor.

[Claim 2] Said carrier assembly is the gear-tooth brush of the claim 1 publication which can reciprocate in the direction which goes to said handle, and the direction to leave.

[Claim 3] Said coupling means is the gear-tooth brush of the claim 2 publication which has the circular gearing which meshes on the rack fixed to said brush head while being combined with said bristle holder in nonrotation.

[Claim 4] Said circular gearing is a gear-tooth brush of the claim 3 publication which has the un-circular socket of the place of the other end of that which has held the circular stem arranged in the place of the end of that held in the circular opening circles currently formed in said carrier assembly, and the un-circular stem formed in said bristle holder.

[Claim 5] Said carrier assembly is the gear-tooth brush of the claim 3 publication which has the secure-closing means for putting firmly on a way plate, the method plate of outside with which circular opening which holds completely said un-circular stem of said bristle holder was formed, and said two plates among these plates together with said circular gearing while said circular opening was formed.

[Claim 6] It is the gear-tooth brush of claim 5 publication with which said secure-closing means has the cylindrical socket with which one side of said plates was equipped, and this cylindrical socket has held the cylindrical pin by which another side of said plate was arranged by the snap action.

[Claim 7] It is the gear-tooth brush of the claim 3 publication which said carrier assembly is supporting said handle and at least two bristle holders you were made to adjust, each bristle holder has the circular gearing, and has geared on the rack fixed to said brush head while this circular gearing is combined with the bristle holder of that in nonrotation.

[Claim 8] Said rack is the gear-tooth brush of the claim 7 publication which are a part of two U typeface members with the leg fixed in said brush head.

[Claim 9] The gear-tooth brush of claim 8 publication with which the gear tooth which has geared with the circular gearing of said both bristle holders is formed in one side of the legs of said U typeface member.

[Claim 10] It is the gear-tooth brush of claim 9 publication with which the gear tooth is formed in a part of each two legs of said U typeface member, and the one section each has geared with one circular gearing of said bristle holder.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application] More specifically, this invention relates to the motorised type gear-tooth brush which has one or more vibrating bristle holders with respect to a gear-tooth brush.

[0002]

[It is Object of the Invention] to [Prior-art list. The motorised type gear-tooth brush equipped with the vibrating bristle holder recently is becoming very general. Such a gear-tooth brush combines with a bristle holder at least one bristle (usually more than it) holder constructed across possible [ vibration ] in the handle arranged by the end of that, the brush head arranged by the other end, and the brush head, the motor in a handle, and a motor, and has the transfer assembly which vibrates the bristle holder at the time of energization of a motor. It has become clear that the vibrational motion of a bristle holder is effective although [ which is accumulated in removal of a dental plaque, i.e., a dental front face, / which is amorphous, namely, strengthens removal of the deposit of amorphism ] it is soft.

[0003] The purpose of this invention is offering the new gear-tooth brush of the format which strengthens removal of a dental plaque further and which was mentioned above.

[0004]

[Means for Solving the Problem] While according to this invention it is a carrier assembly and this carrier assembly is supporting the bristle holder, by the motor Said carrier assembly which can reciprocate together with this bristle holder within a brush head, The transfer assembly has the coupling means between said bristle holders and brush heads, and the gear-tooth brush of the format which is characterized by this coupling means being effective in vibrating this bristle holder in case said bristle holder reciprocates by said motor and which was mentioned above is offered.

[0005] The gear-tooth brush built according to the description mentioned above makes a bristle holder it not only to vibrate a bristle holder around the longitudinal direction axis of itself, but reciprocate also in the right-angled direction to the longitudinal direction axis of that in this way as understood. In case the gear-tooth brush is used for carrying out the brush of the gear tooth according to a movement operation of the duplex of the bristle holder in such a gear-tooth brush, removal of a dental plaque is strengthened further.

[0006]

[Example] The illustrated gear-tooth brush has the brush head 3 and the bristle holder 4 of a pair at a handle 2 and the other end at the end, each bristle holder 4 is constructed across possible [ vibration ] in the brush head, namely, in the surroundings of the longitudinal direction axis of itself, each of the bristle holder 4 is constructed across so that partial rotation may be mutually carried out to hard flow. Further, a gear-tooth brush combines the motor 5 and motor 5 in a handle 2 with the bristle holder 4, and has the transfer assembly which vibrates these bristle holder 4 at the time of energization of a motor.

[0007] This gearing 6 drives the circular gearing 7 which has the crank arm 8 combined with the circular gearing 7 by carrying out eccentricity by one edge 8a by the transfer assembly having the gearing 6 fixed to the output shaft of a motor 5, and it is combined with the rod 9 by other end 8b, and the rod is

made to reciprocate. Socket 9a is formed in the rod 9 at the end of that, and the socket 9a has held the ball formed in the place of edge 8b of a crank arm 8. Circular-sulcus 9b is formed in the other end of a rod 9, this circular-sulcus 9b is combined with the carrier assembly shown by the number 10 as a whole, and this carrier assembly 10 is supporting two bristle holders 4.

[0008] The carrier assembly 10 has the circular gearing 13 of a pair held possible [ vibration ] between the lower part carrier plate 11, the upper part carrier plate 12, and two plates. Rib 11c of a pair is formed in two circular openings 11a and 11b and one edge at the carrier plate 11, and rib 12c of a pair is similarly formed in the carrier plate 12 at the circular openings 12a and 12b of a pair, and the place of an end. Furthermore, cylindrical socket 11d is formed in the carrier plate 11 between [ of two ] circular opening 11a and 11b. Suspension cylindrical pin 12d is formed in the carrier plate 12, this suspension cylindrical pin 12d, hold by the snap action is enabled to socket 11d of the carrier plate 11, and these two plates are fixed among them together with two circular gearings 13.

[0009] Hoop direction gear-tooth 13a, circular stem 13b which has hung from the pars basilaris ossis occipitalis of the hoop direction gear-tooth 13a, and un-circular socket 13c which is carrying out opening from the crowning of this circular stem 13b are formed in the circular gearing's 13 each so that it may be concretely shown by drawing 3 . Circular stem 13b is held pivotable in each circular opening 11a of the lower part carrier plate 11, and 11b, and a circular gearing's other end is held in each opening 12a and 12b of the upper part carrier plate. 12 pivotable. Un-circular socket 13c (for example, hexagonal socket) is made to accept stem 4a of the \*\*\*\* configuration which has hung from the lower limit of each bristle holder 4, and also rotates each bristle holder 4 by rotation of a gearing 13.

[0010] The carrier assembly 10 which has two gearings 13 and each bristle holder 4 can reciprocate in the direction approaching a motor 5, and the direction to leave within hollow 3a formed in the brush head 3. U typeface rack member 14 is being fixed in hollow 3a of the brush head 3. The rack member 14 has leg 14a in which the gear tooth which gears with the gearing 13 of the carrier assembly 10 is formed, and 2nd parallel leg 14b in which the gear tooth is not formed. In this way, if the carrier assembly 10 reciprocates with a rod 9 within hollow 3a of the brush head 3, the gearing 13 which meshes to leg 14 with gear tooth a of U typeface member 14 will vibrate these two bristle holders 4 around each axis of two bristle holders 4.

[0011] The covering plate 15 has closed hollow 3a of a brush head. The openings 15a and 15b of the pair for holding stem 4a of two bristle holders 4 are formed in covering 15. As shown in drawing 2 , openings 15a and 15b are made long and slender in a direction parallel to the longitudinal direction axis of a handle 2, and have allowed the reciprocating motion of the bristle holder 4.

[0012] Actuation of a gear-tooth brush will be in \*\* from the publication mentioned above. Namely, if a motor 5 is energized, a bristle holder will reciprocate by the transfer between it and the bristle holder 4 in the direction which approaches a motor within hollow 3a of the brush head 3, and the direction keeping away. Thus, if the carrier assembly 10 reciprocates, the gearing 13 which meshes to leg 14 with gear tooth a of U typeface rack member 14 fixed in brush head hollow 3a will vibrate two bristle holders around each axis. That is, if the carrier assembly 10 which has the bristle holder 4 moves by front stroke (in direction which keeps away from a motor 5), two gearings 13 will rotate clockwise, and if they move by return stroke (in direction approaching a motor 5), they will rotate counterclockwise. Since two bristle holders 4 are held in nonrotation in a gearing's 13 socket 13c, they rotate counterclockwise during a return stroke clockwise during a front stroke.

[0013] If a motor 5 is made to energize as understood in this way, two bristle holders 4 will receive the both sides of vibrational motion and a reciprocating motion, and will strengthen removal of the dental plaque under dental brushing by it.

[0014] Drawing 6 shows the modification of the structure of U typeface rack member shown by 114. That is, only by covering a part of die length of that at one leg 114a of a rack member, the gear tooth is formed, the gear tooth can be collaborated with the gearing 113 of one brush holder, and the gear tooth in which the gearing 113 of the brush holder of another side and collaboration are possible is formed in leg 114b of another side of a rack member to it. When a motor 5 is energized in \*\*\*\*\* shown in drawing 6 , two bristle holders are made to vibrate mutually in this way like the configuration shown in

drawing 1 -5 unlike the same direction by the reverse direction.

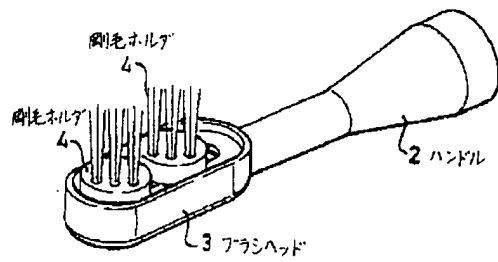
[0015] Many of other modifications are possible. For example, instead of using the rack (14 or 114) for vibrating the bristle holder 4 through a gearing (13), a rack may be combined with a roller by friction and a bristle holder may be vibrated. In addition, the short longitudinal direction split is formed at the end of the rod 9 with which socket 9a for holding ball 8b is formed, and snap fitting of the ball to a socket may be closed if . Many of other deformation, corrections, and application of this invention are in \*\*

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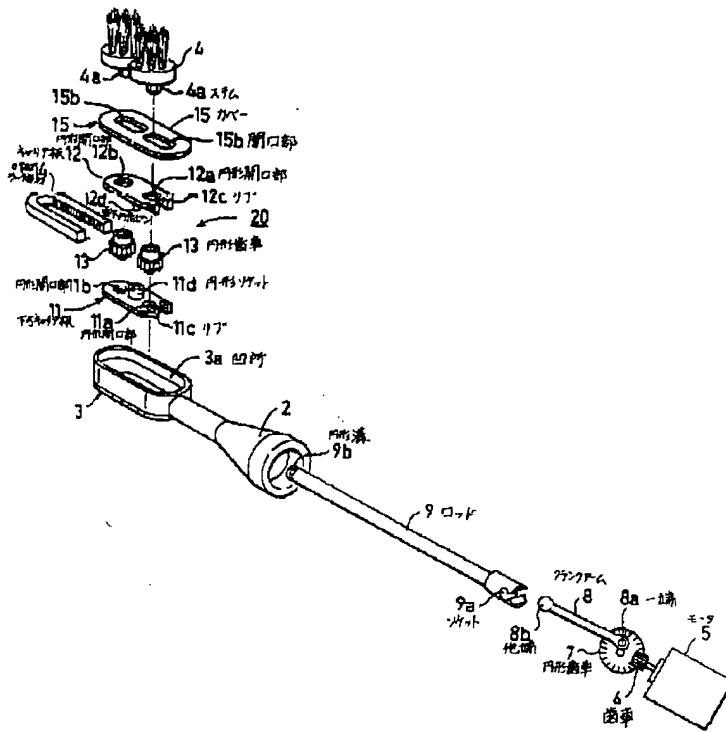
Drawing selection drawing 1

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## Drawing selection | drawing 2

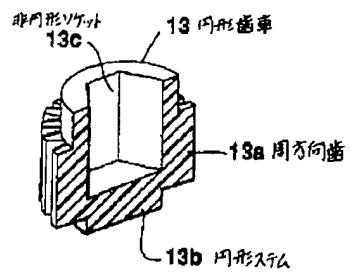


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Drawing selection | drawing 3

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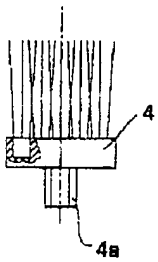



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Drawing selection drawing 4

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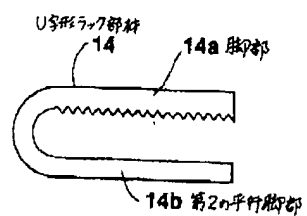


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Drawing selection drawing 5

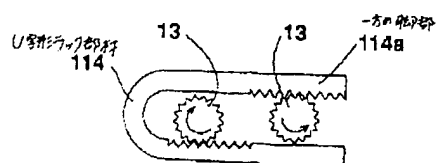
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Drawing selection drawing 6



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